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PRELIMINARY REPORT  
INDUSTRY SERIES

# 1987

## Census of Manufactures

MC87-I-35H(P)  
Issued July 1989

### MISCELLANEOUS MACHINERY, EXCEPT ELECTRICAL

Industries 3592, 3593, 3594, 3596, and 3599

#### INTRODUCTION

This report presents preliminary statistics from the 1987 Census of Manufactures for those establishments classified in the industries listed above. These data will be superseded by a more comprehensive final paperbound report. The method of data collection and use of administrative data are discussed in detail in the appendix.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The definitions of these industries are the same as those used in the 1987 Standard Industrial Classification (SIC) Manual.<sup>1</sup>

#### INDUSTRY 3592, CARBURETORS, PISTONS, RINGS, AND VALVES

In the 1987 Census of Manufactures, Industry 3592, Carburetors, Pistons, Rings, and Valves, had employment of 21.7 thousand. The employment figure was 30 percent below the 31.2 thousand reported in 1982. Compared with 1986, employment in 1987 decreased 25 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was \$2.3 billion. The products primary to this industry appear in table 2 and aggregated to \$2.0 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$1.1 billion in 1987. Data on specific materials consumed appear in table 3.

#### INDUSTRY 3593, FLUID POWER CYLINDERS AND ACTUATORS

In the 1987 Census of Manufactures, Industry 3593, Fluid Power Cylinders and Actuators, had employment of 20.9 thousand.

The total value of shipments for establishments classified in this industry was \$2.0 billion. The products primary to this industry appear in table 2 and aggregated to \$1.8 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$671.1 million in 1987. Data on specific materials consumed appear in table 3.

#### INDUSTRY 3594, FLUID POWER PUMPS AND MOTORS

In the 1987 Census of Manufactures, Industry 3594, Fluid Power Pumps and Motors, had employment of 17.3 thousand.

The total value of shipments for establishments classified in this industry was \$1.6 billion. The products primary to this industry appear in table 2 and aggregated to \$1.6 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$650.8 million in 1987. Data on specific materials consumed appear in table 3.

#### INDUSTRY 3596, SCALES AND BALANCES, EXCEPT LABORATORY

In the 1987 Census of Manufactures, Industry 3596, Scales and Balances, Except Laboratory, had employment

<sup>1</sup>Standard Industrial Classification Manual: 1987. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

Address inquiries to Bureau of the Census, Industry Division, Washington, DC 20233, or call Raphael S. Corrado (301) 763-7304.

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of 6.6 thousand. The employment figure was 6 percent below the 7.0 thousand reported in 1982.

The total value of shipments for establishments classified in this industry was \$628.1 million. The products primary to this industry appear in table 2 and aggregated to \$594.8 million in 1987.

The cost of materials and services used by establishments in this industry amounted to \$273.5 million in 1987. Data on specific materials consumed appear in table 3.

## INDUSTRY 3599, INDUSTRIAL MACHINERY, N.E.C.

In the 1987 Census of Manufactures, Industry 3599, Industrial Machinery, N.E.C, had employment of 225.0 thousand.

The total value of shipments for establishments classified in this industry was \$13.4 billion. The products primary to this industry appear in table 2 and aggregated to \$12.5 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$4.1 billion in 1987. Data on specific materials consumed appear in table 3.

## ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in the tables in this publication:

- Represents zero.
- (D) Withheld to avoid disclosing data for individual companies; data are included in higher level totals.

- (NA) Not available.
- (NC) Not comparable.
- (S) Withheld because estimate did not meet publication standards on the basis of either the response rate or a consistency review.
- (X) Not applicable.
- (Z) Less than half the unit shown.
- do Ditto.
- n.e.c. Not elsewhere classified.
- n.s.k. Not specified by kind.
- pt. Part.
- r Revised.
- SIC Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

## CONTACTS FOR DATA USERS

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# Table 1. Historical Statistics for the Industry: 1987 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendix]

Year <sup>1</sup>	Companies <sup>2</sup> (no.)	All establishments <sup>3</sup>		All employees		Production workers			Value added by manufac- ture <sup>4</sup> (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi- tures (million dollars)	End-of- year inventories <sup>4</sup> (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Special- ization (per- cent)	Cover- age (per- cent)
INDUSTRY 3592, CARBURETORS, PISTONS, RINGS, VALVES															
1987 Census ----	(NA)	153	86	21.7	648.0	17.3	36.7	485.2	1 194.6	1 088.4	2 286.8	104.8	275.8	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	28.8	838.4	22.3	46.3	614.6	1 585.6	1 243.7	2 818.2	244.4	318.0	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	31.6	870.9	24.9	49.8	643.8	1 774.5	1 286.8	3 091.9	188.0	348.7	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	33.4	892.9	26.6	54.3	672.1	1 888.4	1 234.7	3 096.4	96.9	389.0	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	29.8	745.5	23.2	46.7	543.9	1 542.5	928.4	2 485.0	71.1	326.9	(NA)	(NA)
1982 Census ----	149	171	94	31.2	691.9	24.0	46.0	492.4	1 385.1	795.6	2 224.5	106.0	353.5	81	94
1981 ASM -----	(NA)	(NA)	(NA)	32.9	692.8	26.4	50.8	514.8	1 363.9	765.7	2 130.9	137.8	369.7	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	32.5	628.8	25.6	49.3	463.5	1 178.7	673.9	1 838.8	113.9	358.0	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	36.2	661.6	29.4	58.9	504.4	1 295.7	666.7	1 904.1	116.2	343.4	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	33.3	556.5	26.8	53.3	423.5	1 069.4	564.2	1 608.5	120.2	260.5	(NA)	(NA)
1977 Census ----	132	151	84	32.2	508.5	26.0	52.5	388.5	924.9	503.8	1 400.6	79.9	240.0	82	87
1976 ASM -----	(NA)	(NA)	(NA)	31.1	453.2	24.9	49.8	347.2	841.4	444.4	1 256.3	38.6	204.1	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	29.6	374.4	23.6	44.4	272.9	637.9	365.4	1 009.0	30.6	173.3	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	31.9	378.8	25.8	50.8	284.1	625.0	368.5	977.3	29.7	175.3	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	32.5	371.2	26.5	54.0	284.5	669.5	359.6	1 017.6	73.5	152.6	(NA)	(NA)
1972 Census ----	98	113	72	26.7	272.3	21.6	43.5	207.1	500.0	262.3	744.3	27.1	112.4	81	74
INDUSTRY 3593, FLUID POWER CYLINDERS AND ACTUATORS <sup>5</sup>															
1987 Census ----	(NA)	380	182	20.9	618.7	13.7	27.2	346.2	1 292.6	671.1	1 968.1	85.4	416.8	(NA)	(NA)
INDUSTRY 3594, FLUID POWER PUMPS AND MOTORS <sup>5</sup>															
1987 Census ----	(NA)	175	80	17.3	509.4	10.8	22.5	293.3	942.4	650.8	1 604.6	64.3	397.9	(NA)	(NA)
INDUSTRY 3596, SCALES AND BALANCES, EXCEPT LABORATORY <sup>6</sup>															
1987 Census ----	(NA)	131	55	6.6	143.8	3.8	8.3	65.2	351.6	273.5	628.1	12.1	132.1	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	6.9	145.7	4.4	9.1	69.9	356.1	252.3	604.2	9.4	121.8	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	6.9	134.4	4.3	9.1	66.4	332.6	231.8	577.3	79.9	118.8	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	6.9	132.2	4.2	8.4	64.2	324.2	231.2	552.3	11.6	135.9	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	6.7	128.7	4.1	8.1	62.5	319.2	228.1	547.2	712.6	129.2	(NA)	(NA)
1982 Census ----	113	128	63	7.0	128.3	4.2	8.0	62.2	284.0	222.7	516.4	15.9	122.6	98	86
1981 ASM -----	(NA)	(NA)	(NA)	6.6	109.6	4.1	8.4	60.8	277.1	189.0	467.0	11.9	112.8	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	7.2	109.9	4.6	9.4	63.6	337.4	184.6	514.1	11.4	112.5	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	7.8	106.9	5.1	10.5	61.9	318.8	177.9	487.2	11.2	105.3	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	7.3	95.1	4.9	9.8	53.0	267.6	155.9	417.1	13.0	95.5	(NA)	(NA)
1977 Census ----	92	103	46	7.1	84.5	4.7	9.1	46.9	214.9	138.8	348.1	6.8	85.7	96	99
1976 ASM -----	(NA)	(NA)	(NA)	7.4	87.0	4.7	9.2	44.5	243.1	128.1	368.3	5.6	80.6	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	7.2	77.5	4.4	8.6	41.6	203.4	121.8	323.3	9.5	73.8	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	7.3	74.3	4.7	9.6	43.9	185.8	108.4	292.0	6.7	67.9	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	6.8	66.0	4.3	9.2	37.9	168.2	88.6	246.8	4.7	57.4	(NA)	(NA)
1972 Census ----	86	96	43	6.7	59.3	4.1	8.6	32.5	129.7	74.3	200.4	5.7	47.5	92	95
INDUSTRY 3599, INDUSTRIAL MACHINERY, N.E.C. <sup>5</sup>															
1987 Census ----	(NA)	21 100	2 908	225.0	5 042.5	174.8	360.5	3 429.3	9 350.3	4 083.5	13 442.2	528.0	1 805.0	(NA)	(NA)

Note: Establishments of single unit companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. Data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were estimated based on administrative-record information from other agencies in conjunction with industry averages. These establishments accounted for the following percent of total value of shipments: SIC 3592, 3%; SIC 3593, 1%; SIC 3594, 4%; SIC 3596, 8%; SIC 3599, 31%.

<sup>1</sup>In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1972, see 1972 Census of Manufactures, vol. II, table 1a of the Industry chapter.

<sup>2</sup>For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>3</sup>Includes establishments with payroll at any time during year.

<sup>4</sup>Beginning with the 1982 Census of Manufactures, all respondents were requested to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, inventories and value added by manufacture are not comparable to prior-year data.

<sup>5</sup>Industry definition is new for 1987 Census of Manufactures. An explanation of the Standard Industrial Classification revision will appear in the final industry series text that supercedes this report.

<sup>6</sup>Although there was no change in definition or content, old SIC Industry 3576, Scales and Balances, Except Laboratory, was renumbered to new SIC Industry 3596.

<sup>7</sup>Estimates for new capital expenditures have associated standard error of 15 percent or more and may be of limited reliability. Estimates for other data items are of acceptable reliability.

**Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	Year	Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Shipments for replacement including shipments to U.S. motor vehicle manufacturers for resale		Shipments to U.S. motor vehicle manufacturers or their suppliers for use in original equipment (million dollars)	Shipments for export, including transfers to other divisions for export (million dollars)
				Quantity <sup>2</sup>	Value (million dollars)	Quantity	Value (million dollars)		
<b>3592--</b>	<b>CARBURETORS, PISTONS, RINGS, AND VALVES</b>								
	Total -----	1987 1982	(NA) (NA)	(X) (X)	2 037.7 1 908.1	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35921 --	Carburetors, new and rebuilt -----	1987 1982	(NA) (NA)	(X) (X)	926.7 1 028.7	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35921 01	Carburetors (new), all types: For motor vehicle engines (passenger car, truck, and bus) ----- millions--	1987 1982	6 10	**7.8 14.5	544.6 893.8	1.4 1.9	91.0 72.4	(D) 745.3	(D) 76.1
35921 02	All other carburetors ----- do--	1987 1982	8 8	(S) 2.8	90.8 41.7	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35921 03	Carburetors, rebuilt, all types ----- do--	1987 1982	21 10	(S) 1.3	107.2 34.0	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35921 05	Parts for carburetors (excluding gaskets and screw machine products) -----	1987 1982	6 25	(X) (X)	183.3 57.5	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35921 00	Carburetors, n.s.k. -----	1987 1982	(NA) (NA)	(X) (X)	.8 1.7	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35922 --	Pistons, piston rings, and piston pins (engine) -----	1987 1982	(NA) (NA)	(X) (X)	650.8 494.2	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35922 01	Pistons, all types (machined), excluding rough castings: For motor vehicle engines (passenger car, truck, and bus) ----- millions--	1987 1982	17 14	40.1 12.6	315.2 107.7	23.4 7.1	157.6 52.5	132.6 6.7	25.0 48.5
35922 02	All other pistons ----- do--	1987 1982	16 13	(S) 10.8	55.5 115.4	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35922 03	Piston rings, all types, and piston pins: Oil type: For motor vehicle engines (passenger car, truck, and bus) ----- millions--	1987 1982	10 7	(S) 191.2	92.2 72.2	(S) 76.7	19.6 22.8	66.1 43.2	6.5 6.2
35922 04	All other oil type piston rings ----- do--	1987 1982	11 6	(S) 22.7	8.2 10.9	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35922 05	Compression type: For motor vehicle engines (passenger car, truck, and bus) ----- millions--	1987 1982	6 7	(S) 361.1	121.4 132.8	(S) (D)	51.6 (D)	(D) (D)	(D) 6.5
35922 06	All other compression type piston rings ----- do--	1987 1982	12 7	(S) 1.9	32.4 25.2	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35922 09	Piston pins -----	1987 1982	3 3	(X) (X)	(9) (9)	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35922 00	Pistons, piston rings, and piston pins, n.s.k. -----	1987 1982	(NA) (NA)	(X) (X)	325.9 330.0	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35923 --	Valves (engine intake and exhaust) -----	1987 1982	(NA) (NA)	(X) (X)	403.1 325.1	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35923 01	For motor vehicle engines (passenger car, truck, and bus) ----- millions--	1987 1982	10 6	(S) (D)	377.6 249.5	(S) (D)	27.8 (D)	317.8 (D)	32.0 (D)
35923 02	For other engines ----- do--	1987 1982	8 13	(S) (S)	21.4 72.7	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35923 00	Valves, n.s.k. -----	1987 1982	(NA) (NA)	(X) (X)	4.1 2.9	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35920 --	Carburetors, pistons, rings, and valves, n.s.k. -----	1987 1982	(NA) (NA)	(X) (X)	57.1 60.1	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35920 00	Carburetors, pistons, rings, and valves, n.s.k., typically for establishments with 10 employees or more (see note) -----	1987 1982	(NA) (NA)	(X) (X)	26.7 35.9	(X) (X)	(X) (X)	(X) (X)	(X) (X)
35920 02	Carburetors, pistons, rings, and valves, n.s.k., typically for establishments with less than 10 employees (see note) -----	1987 1982	(NA) (NA)	(X) (X)	30.4 24.2	(X) (X)	(X) (X)	(X) (X)	(X) (X)
1987 product code	Product	1987				1982			
		Number of companies with shipments of \$100,000 or more		Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more		Product shipments <sup>1</sup>	
				Quantity <sup>2</sup>	Value (million dollars)			Quantity <sup>2</sup>	Value (million dollars)
<b>3593--</b>	<b>FLUID POWER CYLINDERS AND ACTUATORS</b>								
	Total -----	(NA)	(X)	41 810.4	(NA)	(X)	(4)		
35931 -- 35931 00	Hydraulic and pneumatic cylinders and related items: Hydraulic and pneumatic cylinders and related items, except aerospace (for additional detail, see Current Industrial Report MA-35N, Fluid Power Products, Including Aerospace) -----	246	(X)	760.8	213	(X)	5640.8		
35932 -- 35932 00	Aerospace type hydraulic and pneumatic cylinders and related items: Aerospace type hydraulic and pneumatic cylinders and related items (for additional detail, see Current Industrial Report MA-35N, Fluid Power Products, Including Aerospace) -----	95	(X)	687.5	84	(X)	310.1		

See footnotes at end of table.



Table 2. **Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
3593- --	<b>FLUID POWER CYLINDERS AND ACTUATORS— Con.</b>						
35933 --	Parts for hydraulic and pneumatic cylinders, actuators, accumulators, cushions, and nonvehicular shock absorbers:						
35933 00	Parts for hydraulic and pneumatic cylinders, actuators, accumulators, cushions, and nonvehicular shock absorbers (for additional detail, see Current Industrial Report MA-35N, Fluid Power Products, Including Aerospace) -----	156	(X)	344.9	78	(X)	<sup>7</sup> 144.9
35930 --	Fluid power cylinders and actuators, n.s.k. -----	(NA)	(X)	17.2	(NA)	(X)	( <sup>4</sup> )
35930 00	Fluid power cylinders and actuators, n.e.c., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	2.7	(NA)	(X)	( <sup>4</sup> )
35930 02	Fluid power cylinders and actuators, n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	14.5	(NA)	(X)	( <sup>4</sup> )
3594- --	<b>FLUID POWER PUMPS AND MOTORS</b>						
	<b>Total -----</b>	(NA)	(X)	1 631.6	(NA)	(X)	( <sup>8</sup> )
35941 --	Fluid power pumps, motors, and hydrostatic transmission components (including the valve of the driver if shipped as a complete unit) -----	(NA)	(X)	1 208.2	(NA)	(X)	( <sup>8</sup> )
35941 10	Hydraulic fluid power pumps, motors, and hydrostatic transmission components (including the value of the driver if shipped as a complete unit) (for additional detail, see Current Industrial Report MA-35N, Fluid Power Products, Including Aerospace) -----	132	(X)	1 195.8	98	(X)	<sup>9</sup> 729.8
35941 20	Pneumatic air motors (including the value of the driver if shipped as a complete unit) (for additional detail, see Current Industrial Report MA-35N, Fluid Power Products, Including Aerospace) -----	6	(X)	12.4	(NA)	(X)	( <sup>8</sup> )
35941 00	Fluid power pumps, motors, and hydrostatic transmission components (including the value of the driver if shipped as a complete unit), n.s.k. -----	(NA)	(X)	-	(NA)	(X)	( <sup>8</sup> )
35942 --	Parts and attachments for fluid power pumps, motors, and hydrostatic transmissions -----	(NA)	(X)	364.4	(NA)	(X)	( <sup>8</sup> )
35942 10	Parts and attachments for hydraulic fluid power pumps, motors, and hydrostatic transmissions (for additional detail, see Current Industrial Report MA-35N, Fluid Power Products, Including Aerospace) -----	86	(X)	347.5	45	(X)	<sup>10</sup> 322.4
35942 20	Parts for pneumatic air motors (for additional detail, see Current Industrial Report MA-35N, Fluid Power Products, Including Aerospace) -----	10	(X)	16.9	(NA)	(X)	( <sup>8</sup> )
35942 00	Parts and attachments for fluid power pumps, motors, and hydrostatic transmissions, n.s.k. -----	(NA)	(X)	-	(NA)	(X)	(NA)
35940 --	Fluid power pumps and motors, n.s.k. -----	(NA)	(X)	59.0	(NA)	(X)	( <sup>8</sup> )
35940 00	Fluid power pumps and motors, n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	14.6	(NA)	(X)	( <sup>8</sup> )
35940 02	Fluid power pumps and motors, n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	44.4	(NA)	(X)	( <sup>8</sup> )
3596- --	<b>SCALES AND BALANCES, EXCEPT LABORATORY</b>						
	<b>Total -----</b>	(NA)	(X)	<sup>11</sup> 594.8	(NA)	(X)	<sup>11</sup> 545.2
35961 --	Vehicle and industrial scales -----	(NA)	(X)	241.0	(NA)	(X)	<sup>12</sup> 207.2
35961 01	Motor truck scales ----- thousands..	11	(S)	33.7	13	<sup>**</sup> 4.0	35.2
35961 03	Railroad track scales ----- do..	4	(S)	4.1	8	(S)	5.6
	Industrial scales:						
35961 05	Bench and portable ----- thousands..	10	(S)	40.2	14	(S)	24.0
35961 07	Floor scales, dormant, pitless -----	11	(S)	18.0	15	<sup>**</sup> 6.9	22.8
35961 09	Automatic checkweigher ----- do..	4	(S)	13.7	4	9	14.1
35961 11	Bulkweigher ----- do..	5	(S)	16.8	9	(S)	16.4
35961 13	Over-under (predetermined weight) ----- do..	7	(S)	13.0	3	(S)	4.5
35961 15	Miscellaneous industrial scales, including special purpose, crane, suspension, tank, hopper, force measuring devices, and conveyor scales (weigh and feed) for bulk materials ----- do..	20	(S)	88.8	29	(S)	72.4
35961 17	Counting scales ----- do..	6	<sup>11</sup> 5	9.7	6	(S)	12.2
35961 00	Vehicle and industrial scales, n.s.k. -----	(NA)	(X)	3.0	(NA)	(X)	-
35962 --	Retail, commercial, household, and mailing scales -----	(NA)	(X)	192.9	(NA)	(X)	<sup>12</sup> 223.2
	Retail and commercial scales:						
35962 01	Delicatessen ----- thousands..	5	(S)	15.6	6	<sup>**</sup> 12.8	12.7
35962 03	Checkstand ----- do..	4	(S)	7.9	3	(D)	( <sup>13</sup> )
35962 05	Automatic prepack ----- do..	3	(S)	6.5	3	(S)	<sup>13</sup> 35.6
35962 07	Other ----- do..	8	(S)	<sup>14</sup> 25.7	10	<sup>16</sup> 1 821.5	<sup>16</sup> 23.7
	Household and person-weighing scales:						
35962 09	Bathroom ----- thousands..	3	}	(S)	6	<sup>**</sup> 6 481.2	50.4
35962 11	Person-weighing scales (coin-operated and free weighing) and miscellaneous household scales (including kitchen, baby scales, etc.) ----- do..	6			6	(S)	23.6

See footnotes at end of table.

**Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>		Number of companies with shipments of \$100,000 or more	Product shipments <sup>1</sup>	
			Quantity <sup>2</sup>	Value (million dollars)		Quantity <sup>2</sup>	Value (million dollars)
<b>3596--</b>	<b>SCALES AND BALANCES, EXCEPT LABORATORY—Con.</b>						
35962 --	Retail, commercial, household, and mailing scales—Con.						
35962 13	Mailing and parcel post scales:						
35962 15	Handheld ----- thousands--	1	(S)	56.6	10	(S)	77.2
	Other ----- do--	5					
	Other balances with or without weights:						
35962 17	Sensitivity of 5 cg or better -----	1	(X)	( <sup>14</sup> )	(NA)	(X)	( <sup>15</sup> )
35962 19	Sensitivity of less than 5 cg -----	2	(X)	( <sup>14</sup> )	(NA)	(X)	( <sup>15</sup> )
35962 00	Retail, commercial, household, and mailing scales, n.s.k. -----	(NA)	(X)	-	(NA)	(X)	-
35963 --	Parts, attachments, and accessories for scales and balances -----	(NA)	(X)	92.0	(NA)	(X)	1284.9
	Accessories and attachments (sold separately):						
35963 01	Printers ----- thousands--	9	(S)	10.7	9	16.6	16.1
35963 03	Digital indicators ----- do--	9	(S)	27.0	7	**9.5	10.8
35963 05	Other -----	9	(X)	19.8	9	(X)	9.6
35963 09	Parts for scales and balances (sold for assembly elsewhere, repair, service, etc.) -----	19	(X)	34.1	24	(X)	48.4
35963 00	Parts, attachments, and accessories for scales and balances, n.s.k. -----	(NA)	(X)	.4	(NA)	(X)	-
35960 --	Scales and balances, except laboratory, n.s.k. -----	(NA)	(X)	68.9	(NA)	(X)	1229.8
35960 00	Scales and balances, n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	40.1	(NA)	(X)	15.5
35960 02	Scales and balances, n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	28.8	(NA)	(X)	14.3
<b>3599--</b>	<b>INDUSTRIAL MACHINERY N.E.C.</b>						
	Total -----	(NA)	(X)	<sup>16</sup> 12 487.6	(NA)	(X)	<sup>16</sup> 10 602.0
35994 --	Miscellaneous machinery products, including flexible metal hose and tubing, metal bellows, etc. -----	(NA)	(X)	1 754.3	(NA)	(X)	1 582.4
	Flexible metal hose and tubing:						
35994 11	Copper and copper-base alloy -----	28	(X)	41.7	25	(X)	26.2
35994 13	Aluminum and aluminum-base alloy -----	76	(X)	50.1	48	(X)	19.8
35994 15	Stainless steel -----	85	(X)	102.9	76	(X)	79.2
35994 16	Other -----	80	(X)	77.0	56	(X)	59.7
35994 25	Metal bellows -----	30	(X)	92.8	24	(X)	88.6
35994 31	Carnival and amusement park equipment (ferris wheels, merry-go-rounds, etc.), excluding coin-operated amusement machines -----	11	(X)	23.3	21	(X)	26.0
35994 98	All other miscellaneous machinery products (weather vanes; swage blocks; leak detectors; propellers, ship and boat, machined, etc.) -----	(NA)	(X)	1 304.7	1 475	(X)	1 216.0
35994 00	Miscellaneous machinery products, n.s.k. -----	(NA)	(X)	61.8	(NA)	(X)	68.9
35995 --	Receipts for machine shop job work:						
35995 00	Receipts for machine shop job work (machining of material owned by others) -----	(NA)	(X)	( <sup>17</sup> )	5 334	(X)	5 594.5
35990 --	Industrial and commercial machinery, n.e.c., n.s.k. -----	(NA)	(X)	( <sup>17</sup> )	(NA)	(X)	<sup>18</sup> 3 425.1
35990 00	Industrial and commercial machinery, n.e.c., n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	( <sup>17</sup> )	(NA)	(X)	<sup>18</sup> 2 088.0
35990 02	Industrial and commercial machinery, n.e.c., n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	<sup>18</sup> 1 416.5	(NA)	(X)	<sup>18</sup> 1 337.1

Note: In 1987 Census of Manufactures, data for establishments of small single unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoffs used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1987 and 1982 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

<sup>1</sup>Data reported by all producers not just those with shipments of \$100,000 or more.

<sup>2</sup>For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: \* 10 to 19 percent estimated; \*\* 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

<sup>3</sup>For 1987 and 1982, data for product code 35922 09 have been combined with product code 35922 00 to avoid disclosing data for individual companies.

<sup>4</sup>SIC Industry 3593, Fluid Power Cylinders and Actuators is published as a separate industry for the first time in 1987. Data were included in old SIC Industry 3599, Machinery, Except Electrical, N.E.C., in 1982 and are not available separately.

<sup>5</sup>In 1982, data for product code 35931 00 were published under old SIC product codes 35996 00 and 35997 00.

<sup>6</sup>In 1982, data for product code 35932 00 were published under old SIC product code 35998 00.

<sup>7</sup>In 1982, data for product code 35933 00 were published under old SIC product code 35999 00.

<sup>8</sup>SIC Industry 3594, Fluid Power Pumps and Motors is published as a separate industry for the first time in 1987. Data were included in old SIC Industries 3561, Pumps and Pumping Equipment, and 3563, Air and Gas Compressors in 1982 and are not available separately.

<sup>9</sup>In 1982, data for product code 35941 10 were published under old product codes 35617 00 and 35618 00.

<sup>10</sup>In 1982, data for product codes 35942 10 were published under old product codes 3561A 00 and 3561B 00.

<sup>11</sup>In the 1987 SIC revisions, SIC Industry 3596 was renumbered from the old SIC Industry 3576, Scales and Balances, Except Laboratory.

<sup>12</sup>In 1982, data for product codes 35961 --, 35962 --, 35963 --, and 35960 -- were published under old SIC product code 35760 --.

<sup>13</sup>For 1982, data for product code 35962 03 have been combined with product code 35962 05 to avoid disclosing data for individual companies.

<sup>14</sup>For 1987, product codes 35962 17 and 35962 19 were combined with product code 35962 07 to avoid disclosing data for individual companies.

<sup>15</sup>For 1982, product codes 35962 17 and 35962 19 were not collected separately but were included with product code 35962 07.

<sup>16</sup>In the 1987 SIC revisions, old SIC Industry 3599, Machinery, Except Electrical, N.E.C., was split into new SIC Industries 3593, Fluid Power Cylinders and Actuators, and 3599, Industrial Machinery, N.E.C.

<sup>17</sup>Although included in the total, separate data are being withheld from this report pending further review, but will be published at a later date in the final industry series that supercedes this report.

<sup>18</sup>These data include an undeterminable amount of fluid power cylinder and actuator manufacturers (SIC 3593) who did not totally identify their products.



**Table 3. Materials Consumed by Kind: 1987 and 1982**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3592, CARBURETORS, PISTONS, RINGS, VALVES</b>				
	Materials, parts, containers, and supplies -----	(X)	1 023.4	(X)	718.7
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	16.7	24.8	18.3
331012	Sheet and strip ----- do..	(S)	50.4	29.7	14.6
331006	All other carbon steel mill shapes and forms ----- do..	(S)		(S)	7.8
331020	Alloy steel, except stainless ----- do..	(S)	40.1	(S)	18.5
331031	Stainless steel ----- do..	(D)		11.1	24.2
335004	Copper and copper-base alloy ----- mil lb..	(D)	(D)	(S)	9.6
	Aluminum and aluminum-base alloy:				
335405	Extruded shapes, including rod, bar, pipe, tube, etc. ----- mil lb..	(S)	29.6	25.9	14.1
335011	All other ----- do..	(S)		(D)	11.0
335609	Nonferrous metal, except copper and aluminum ----- do..	(S)	2.9	(S)	1.7
	Castings (rough and semifinished):				
332001	Iron (gray and malleable) and steel castings ----- 1,000 s tons..	(S)	39.7	(S)	38.0
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	202.7	*29.4	37.2
336003	Other nonferrous ----- do..	(D)		(S)	23.7
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	64.6	(X)	32.0
354501	Cutting tools for machine tools -----	(X)	(D)	(X)	6.9
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets -----				
308004	Fabricated plastics products, except hose, belting, and gaskets -----	(X)	23.3	(X)	20.5
329321	Gaskets -----	(X)	11.3	(X)	8.5
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses -----	(X)	(D)	(X)	( <sup>2</sup> )
320601	Ceramic and ceramic composite parts, components, and accessories -----	(X)	(D)	(X)	( <sup>2</sup> )
970099	All other materials and components, parts, containers, and supplies -----	(X)	396.5	(X)	*381.1
971000	Materials, parts, containers, supplies, n.s.k. <sup>2</sup> -----	(X)	70.0	(X)	53.0
	<b>INDUSTRY 3593, FLUID POWER CYLINDERS AND ACTUATORS</b>				
	Materials, parts, containers, and supplies -----	(X)	524.0	(NA)	( <sup>4</sup> )
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	61.1	(NA)	(NA)
331012	Sheet and strip ----- do..	(S)	3.3	(NA)	(NA)
331013	Plates ----- do..	(S)	5.3	(NA)	(NA)
331015	Structural shapes ----- do..	(S)	6.2	(NA)	(NA)
331017	Wire and wire products ----- do..	(S)	.8	(NA)	(NA)
331019	All other carbon steel mill shapes and forms ----- do..	(S)	58.4	(NA)	(NA)
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons..	(S)	9.3	(NA)	(NA)
331029	All other alloy steel mill shapes and forms ----- do..	3.7	7.4	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons..	(S)	1.5	(NA)	(NA)
331050	All other stainless steel mill shapes and forms ----- do..	(S)	20.8	(NA)	(NA)
	Copper and copper-base alloy:				
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- mil lb..	(S)	2.5	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do..	(S)	1.9	(NA)	(NA)
335152	Pipe and tube ----- do..				
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	(S)	1.2	(NA)	(NA)
335405	Extruded shapes, including rod, bar, pipe, tube, etc. ----- do..	(S)	13.3	(NA)	(NA)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	*2.3	6.3	(NA)	(NA)
335609	Nonferrous metal, except copper and aluminum ----- do..	(D)	( <sup>5</sup> )	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons..	(S)	11.2	(NA)	(NA)
332045	Steel ----- do..	(S)	10.4	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	8.1	(NA)	(NA)
336006	Copper and copper-base alloy ----- do..	(S)	.7	(NA)	(NA)
336003	Other nonferrous ----- do..	(S)	.2	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products -----	(X)	27.2	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies -----	(X)	*210.2	(NA)	(NA)
971000	Materials, parts, containers, supplies, n.s.k. <sup>2</sup> -----	(X)	56.7	(NA)	(NA)
	<b>INDUSTRY 3594, FLUID POWER PUMPS AND MOTORS</b>				
	Materials, parts, containers, and supplies -----	(X)	572.7	(NA)	( <sup>4</sup> )
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	7.7	(NA)	(NA)
331012	Sheet and strip ----- do..	(S)	.5	(NA)	(NA)
331013	Plates ----- do..	(S)	.3	(NA)	(NA)
331015	Structural shapes ----- do..	(S)	.7	(NA)	(NA)
331055	All other ----- do..	(S)	3.9	(NA)	(NA)
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons..	(S)	9.5	(NA)	(NA)
331029	All other alloy steel mill shapes and forms ----- do..				
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons..	(S)	7.1	(NA)	(NA)
331050	All other stainless steel mill shapes and forms ----- do..				
	Copper and copper-base alloy:				

See footnotes at end of table.



Table 3. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
INDUSTRY 3594, FLUID POWER PUMPS AND MOTORS—Con.					
Mill shapes and forms, except castings and forgings—Con.					
Copper and copper-base alloy—Con.					
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes .....	(S)	1.2	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs .....	(S)		(NA)	(NA)
335152	Pipe and tube .....	(S)		(NA)	(NA)
Aluminum and aluminum-base alloy:					
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ....	(S)	6.3	(NA)	(NA)
335007	All other (sheet, plate, foil, wire, rolled rod and bar, powder, welded tubing, etc.) .....	(S)	.3	(NA)	(NA)
335609	Nonferrous metal mill shapes and forms, except copper and aluminum .....	(S)	.2	(NA)	(NA)
Primary metals:					
331051	Pig iron, excluding silvery iron .....	(D)	(D)	(NA)	(NA)
333122	Copper and copper base alloy refinery shapes .....	(D)	(D)	(NA)	(NA)
335792	Insulated copper wire and cable, except magnet wire (quantity of copper-content) .....	(S)	.2	(NA)	(NA)
339915	Metal powders .....	(S)	5.2	(NA)	(NA)
190023	Iron and steel scrap, excluding home scrap .....	(D)	(D)	(NA)	(NA)
Castings (rough and semifinished):					
332011	Iron (gray and malleable) .....	**37.7	36.8	(NA)	(NA)
332045	Steel .....	(S)	4.4	(NA)	(NA)
336005	Aluminum and aluminum-base alloy .....	(S)	17.3	(NA)	(NA)
336006	Copper and copper-base alloy .....	(D)	(D)	(NA)	(NA)
336008	Other nonferrous .....	(S)	2.0	(NA)	(NA)
346200	Iron and steel forgings .....	(S)	6.1	(NA)	(NA)
346701	Metal stampings .....	(S)	3.1	(NA)	(NA)
Engines:					
351920	Diesel and semidiesel .....	(Z)	(Z)	(NA)	(NA)
351901	Gasoline and other carburetor engines .....	(D)	(D)	(NA)	(NA)
Electric motors and generators:					
362115	Fractional horsepower electric motor (less than 1 hp), excluding timing motors .....	(D)	(D)	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp or more) .....	(S)	15.3	(NA)	(NA)
Bearings, including mounted and unmounted:					
356218	Ball .....	(X)	7.1	(NA)	(NA)
356201	Roller .....	(X)	14.0	(NA)	(NA)
356810	Plain bearings and bushings .....	(X)	4.7	(NA)	(NA)
356601	Speed changers, drives, gears, industrial high-speed drivers .....	(X)	5.3	(NA)	(NA)
265001	Paperboard containers, boxes, and corrugated paperboard .....	(S)	2.2	(NA)	(NA)
305201	Rubber and plastics hose and belting .....	(X)	1.0	(NA)	(NA)
306902	Fabricated rubber products, except tires, tubes, belts, hosing, and gaskets .....	(X)	4.1	(NA)	(NA)
308006	Fabricated plastics products, except gaskets, hose, and belting .....	(X)	.6	(NA)	(NA)
329300	Gaskets (all types) and asbestos packing .....	(X)	1.7	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products .....	(X)	15.8	(NA)	(NA)
344301	Metal tanks, heat exchangers, steam condensers, and other boiler products, fabricated steel plate, and weldments .....	(X)	3.2	(NA)	(NA)
349402	Fabricated metal pipe, valves, and pipe fittings .....	(X)	6.2	(NA)	(NA)
354501	Cutting tools for machine tools .....	(X)	14.6	(NA)	(NA)
356101	Pumps and pump parts used as materials .....	(X)	28.6	(NA)	(NA)
356301	Air and gas compressors, except refrigeration .....	(D)	(D)	(NA)	(NA)
357001	Electronic computing equipment and parts .....	(D)	(D)	(NA)	(NA)
360101	Electrical transmission, distribution, and control equipment .....	(X)	1.3	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies .....	(X)	168.5	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> .....	(X)	145.8	(NA)	(NA)
INDUSTRY 3596, SCALES AND BALANCES, EXCEPT LABORATORY					
Materials, parts, containers, and supplies .....		(X)	238.1	(X)	201.5
Mill shapes and forms, except castings and forgings:					
Carbon steel:					
331011	Bars and bar shapes .....	(S)	5.5	(S)	8.2
331012	Sheet and strip .....	(D)	( <sup>6</sup> )	(S)	16.1
331015	Structural shapes .....	(S)	.9	*19.5	11.1
331017	Wire and wire products .....	(S)	.4	(S)	1.2
331056	All other carbon steel mill shapes and forms .....	(S)	4.2	(S)	1.2
331020	Alloy steel, except stainless .....	(S)	3.0	4.1	2.4
331031	Stainless steel .....	(S)	1.8	(S)	5.0
335105	Copper and copper-base alloy .....	(D)	( <sup>6</sup> )	(S)	2.7
335001	Aluminum and aluminum-base alloy .....	(S)	.7	(S)	2.2
Castings (rough and semifinished):					
332001	Iron (gray and malleable) and steel castings .....	(S)	1.7	(D)	( <sup>6</sup> )
336002	Nonferrous .....	(S)	2.8	(D)	( <sup>6</sup> )
Bearings, including mounted and unmounted:					
356218	Ball .....	(X)	.2	(X)	2.8
356201	Roller .....	(X)	(Z)	(X)	3.8
344401	Sheet metal products, except stampings .....	(X)	3.0	(X)	1.1
346901	Metal stampings .....	(X)	1.4	(X)	2.8
345001	Bolts, nuts, screws, rivets, and screw machine products .....	(X)	2.3	(X)	12.4
367408	Semiconductors .....	(X)	8.6	(X)	
367002	Resistors, capacitors, transformers, transducers, and other electronic-type components and accessories, except semiconductors .....	(X)	17.3	(X)	16.4

See footnotes at end of table.

Table 3. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity <sup>1</sup>	Delivered cost (million dollars)	Quantity <sup>1</sup>	Delivered cost (million dollars)
	<b>INDUSTRY 3596, SCALES AND BALANCES, EXCEPT LABORATORY—Con.</b>				
364301	Appliance outlets, switches, lempholders, and other current-carrying wiring devices .....	(X)	4.1	(X)	2.6
360101	Electrical transmission distribution and control equipment, including switchgear, fuses, transformers, relays, regulators, etc. ....	(X)	5.0	(X)	6.7
265001	Paperboard boxes and containers and corrugated paperboard .....	(X)	1.6	(X)	2.4
308006	Fabricated plastics products, except gaskets, hose, and belting .....	(X)	3.7	(X)	3.6
970099	All other materials and components, parts, containers, and supplies .....	(X)	<sup>5</sup> 82.2	(X)	<sup>5</sup> 72.9
971000	Materials, parts, containers, and supplies, n.s.k. <sup>2</sup> .....	(X)	87.7	(X)	25.1
	<b>INDUSTRY 3599, INDUSTRIAL MACHINERY, N.E.C.</b>				
	Materials, parts, containers, and supplies .....	(X)	3 266.4	(NA)	( <sup>4</sup> )
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes .....	(S)	94.7	(NA)	(NA)
331012	Sheet and strip .....	(S)	27.1	(NA)	(NA)
331013	Plates .....	(S)	36.3	(NA)	(NA)
331015	Structural shapes .....	(S)	14.9	(NA)	(NA)
331017	Wire and wire products .....	(S)	5.2	(NA)	(NA)
331019	All other carbon steel mill shapes and forms .....	(S)	18.3	(NA)	(NA)
	Alloy steel, except stainless:				
331021	Bars and bar shapes .....	(S)	44.5	(NA)	(NA)
331029	All other alloy steel mill shapes and forms .....	(S)	15.6	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip .....	(S)	40.8	(NA)	(NA)
331050	All other stainless steel mill shapes and forms .....	(S)	38.1	(NA)	(NA)
	Copper and copper-base alloy:				
335102	Rod, bar, and mechanical wire, including extruded and/or drawn shapes .....	(S)	13.9	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs .....	<sup>6</sup> 9.1	12.5	(NA)	(NA)
335152	Pipe and tube .....	(S)	7.5	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil .....	(S)	43.1	(NA)	(NA)
335405	Extruded shapes, including rod, bar, pipe, tube, etc. ....	(S)	30.1	(NA)	(NA)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) .....	(S)	11.3	(NA)	(NA)
335609	Nonferrous metal, except copper and aluminum .....	(S)	4.9	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) .....	(S)	92.3	(NA)	(NA)
332045	Steel .....	(S)	34.7	(NA)	(NA)
336005	Aluminum and aluminum-base alloy .....	(S)	155.8	(NA)	(NA)
336006	Copper and copper-base alloy .....	(S)	9.3	(NA)	(NA)
336008	Other nonferrous .....	(S)	29.9	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products .....	(X)	28.1	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies .....	(X)	345.6	(NA)	(NA)
971000	Materials, parts, containers, supplies, n.s.k. <sup>2</sup> .....	(X)	2 111.9	(NA)	(NA)

<sup>1</sup>For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: \* 10 to 19 percent estimated; \*\* 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

<sup>2</sup>Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

<sup>3</sup>For 1982, data for material codes 280020 and 320601 were not collected separately but included with material code 970099.

<sup>4</sup>Industry definition is new for 1987 and, therefore, 1987 data for materials consumed are not comparable to prior-year data. As a result, 1982 materials consumed data are not available.

<sup>5</sup>Data have been combined with material code 970099 to avoid disclosing data for individual companies.

<sup>6</sup>For 1987, data for material code 331012 have been combined with material code 331056 to avoid disclosing data for individual companies.





# APPENDIX

## Scope and Coverage and Explanation of Terms

### GENERAL

The 1987 Census of Manufactures is the 32nd census of manufacturing establishments conducted in the United States. For 1987, it was conducted as part of the economic censuses, which included the censuses of mineral industries, construction industries, retail and wholesale trades, service industries, selected transportation activities, and minority-owned and women-owned businesses, under authority of title 13 of the United States Code. Title 13 specifies that an economic census be conducted every 5 years to cover years ending in 2 and 7.

### SCOPE AND COVERAGE

#### Establishment Basis of Reporting

The census of manufactures is conducted on an establishment basis. All manufacturing establishments with one paid employee or more at any time during the year are covered by the census of manufactures. Therefore, a company operating at more than one location is required to file a separate report for each location. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units which service manufacturing establishments of the same company. Where these auxiliary operations are conducted at the same location as the manufacturing operation, they are usually included in the report for the operating manufacturing establishment.

#### Use of Administrative Records

From a universe of approximately 350,000 manufacturing establishments in the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of the small establishment nonmail cases was done on an industry-by-industry basis. A variable cutoff was used to determine those establishments for which administrative records were to be used in place of a census report. The cutoffs were selected so the administrative-record cases would account for approximately 3 percent or less of the value of shipments for the industry. These cutoffs were then adjusted so that all single-establishment companies with less than 5 employees were excluded from the mail canvass, while all establishments with more than 20 employees were included. Where establishments in the 5 to 20 employee size range were included in the mail canvass, an abbreviated census form was frequently used.

For these nonmail establishments, (and a small number of larger establishment whose reports were not received at the time the data were tabulated) data on employment, payroll, and receipts were obtained from administrative records of other government agencies rather than from census forms. The administrative-record information was then used in conjunction with industry averages to estimate the data for these establishments. The value of shipments and cost of materials were not distributed among specific products and materials but were included in the product and material "not specified by kind" (n.s.k.) categories.

### EXPLANATION OF TERMS

**Number of establishments and companies**—A separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

**All employees**—Includes all full-time and part-time employees on the payrolls at any time during the year. Included are all persons on paid sick leave, paid holidays, and paid vacations. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average of those for midmonth payroll periods of March, May, August, and November.

**Production workers**—Includes workers up through the working-supervisor level engaged in fabricating, processing, assembling, inspecting, receiving, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial, guard services, product development, auxiliary production for plant's own use (e.g., power-plant), recordkeeping, and other closely associated services. Truckdrivers delivering ready-mixed concrete are also included in production workers.

**Other employees**—Includes nonproduction personnel, including those engaged in the following activities: supervision above working-supervisor level, sales (including driver/salespersons), sales delivery (truckdrivers and helpers), advertising, credit collection, installation and



servicing of own product, clerical and routine office functions, executive, purchasing, finance, legal, personnel (including cafeteria, etc.), professional, and technical employees.

**Payroll**—Includes the gross earnings for the “employees” defined above, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees’ Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. Respondents were told that in reporting they could follow the definition of payrolls used for calculating the Federal withholding tax.

**Production-worker hours**—Covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

**Cost of materials**—Refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuels consumed, regardless of whether they were purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (a) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year; (b) electric energy purchased; (c) fuels consumed for heat, power, or generating electricity; (d) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (e) products bought and resold in the same condition.

**Specific materials consumed (table 3)**—In addition to the total cost of materials which every establishment was required to report, information was also collected for most manufacturing industries on the consumption of major materials used in manufacturing. These inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers’ records. Establishments consuming less than a specified amount (usually \$10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which administrative records were used was estimated as “not specified by kind” (n.s.k.).

**Value of shipments and other receipts**—Generally refers to received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all

miscellaneous receipts such as receipts for contract work performed for others, installation and repair receipts; sale of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishment from materials owned by it whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In a few industries, the value of production or value of work completed is used instead of value of shipments. These industries are identified in the introduction and are footnoted in table 1.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, that is, including not only the direct costs of production but also a reasonable proportion of “all other costs” (including company overhead and profit).

**Shipments or production of individual products (table 2)**—In the 1987 census, detailed shipment information was collected for approximately 11,000 individual products. These products are identified by a seven-digit code and are grouped into approximately 1,500 classes of products, which in turn are primary to 459 four-digit industries. Data at the five-digit product-class level have been collected each year as part of the annual survey of manufactures. Information at the seven-digit level, collected for many industries in the current industrial reports program, is not included in this table.

**Value added by manufacture**—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments for products manufactured plus receipts for services rendered. The result of this calculation is then adjusted by the addition of value added by merchandising operations (that is, the difference between the sales value and cost of merchandise sold without further manufacturing, processing, or assembly) plus the net change in finished goods and work-in-process inventories between the beginning and end of the year.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1), value added is adjusted only for the change in work-in-process inventories between the beginning and end of the year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

Value added avoids the duplication in the figure for value of shipments which results from the use of products of some establishments as materials by others. Value

added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

**Expenditures for new plant and equipment**—Establishments in operation and any known plants under construction were asked to report their expenditures for (a) permanent additions and major alterations to manufacturing establishments and (b) new machinery and equipment used for replacement and additions to plant capacity if they are of the type for which depreciation accounts are ordinarily maintained.

These totals exclude expenditures for used plant and equipment, expenditures for land, and cost of maintenance and repairs charged as current operating expenses. Data for used plant and equipment will be published in the final industry bulletin.

**End-of-year inventories**—Comprised of (a) finished products; (b) work-in-process; and (c) materials, supplies, fuels, etc. Beginning in 1982, respondents were asked to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method.

Therefore, 1982 through 1987 data for inventories are not strictly comparable to prior-year data.

**Specialization and coverage ratios**—An establishment is classified in a particular industry if its shipments of primary products of the industry exceed in value its shipments of the products of any other single industry. An establishments' shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). The following ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in table 1 and data on product shipments shown in table 2.

**Specialization ratio**—Represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

**Coverage ratio**—Represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments, wherever classified.



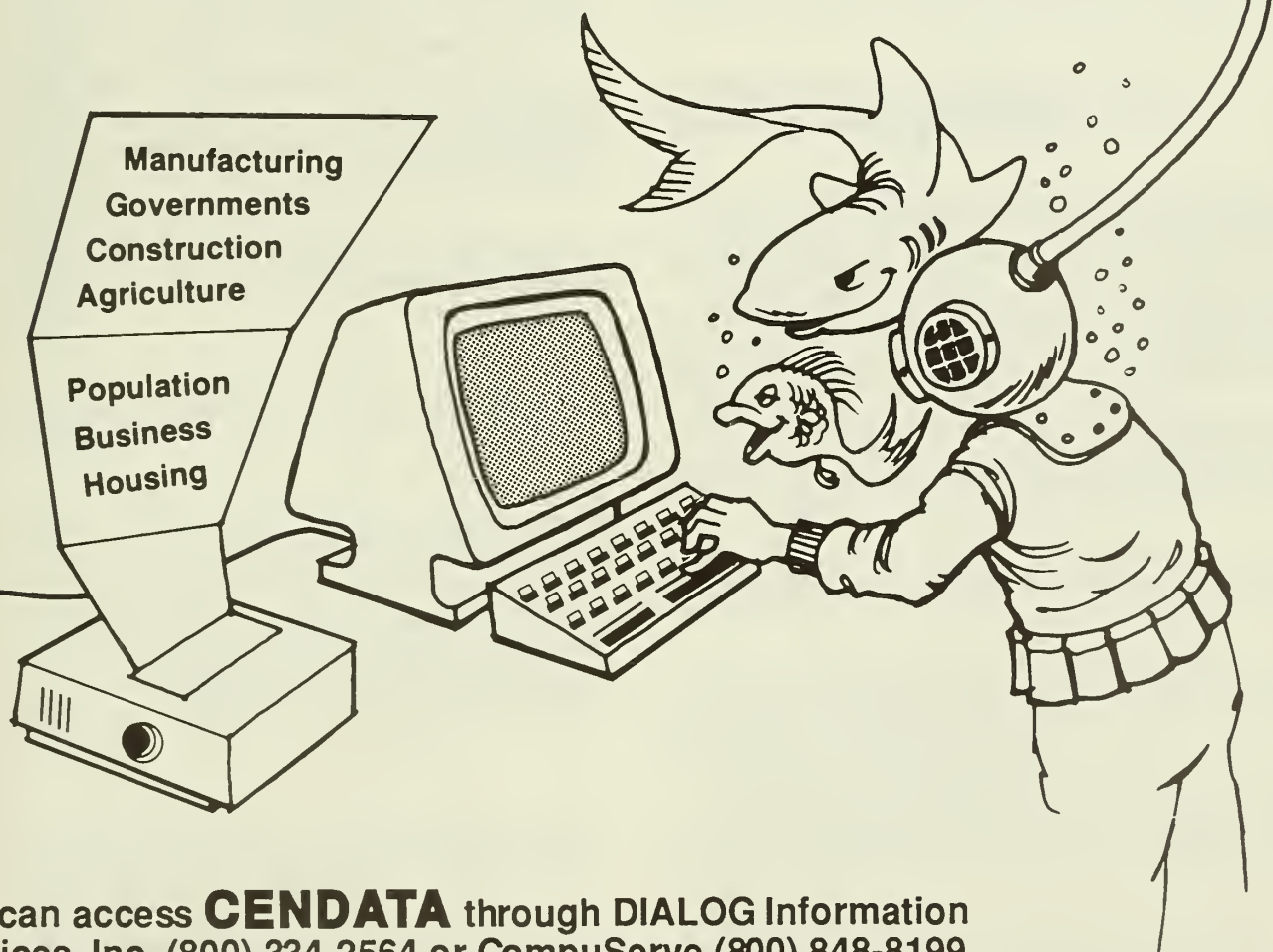


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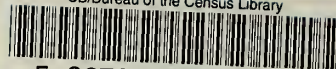
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